

Supplementary Materials

Table S1. shows the summary information about the site, the datasets, and the runtime of the models.

		Site 1: Maysville	Site 2: Surf City	Site 3: Masonboro	Site 4: River Road
Site Information	Latitude (DMS)	77°14'17"W	77°33'15"W	77°49'39"W	77°55'11"W
	Longitude (DMS)	34°54'1"N	34°26'24"N	34°10'15"N	34°5'12"N
	Wetland Class	PFO Water Non-wetland	E2EM PFO PSS Water Non-wetland	E2EM Water Non-wetland	PFO PEM Water Non-wetland
	Area of Interest in Acres	43.8	78.3	110.0	54.3
Fieldwork Information	Survey Dates	1/22/2021	11/6/2020	12/11/2020	10/2/2020
	# GCPs	9	12	17	11
Multispectral Imagery	Geotags in Flight, overall	2.435 m	2.652 m	2.432 m	8.944 m
	Geotags PPK, overall	0.085 m	0.094 m	0.080 m	0.567 m
	GCPs XYZ RMSE	14 cm	15 cm	27 cm	10 cm
	GCPs used numbers	5	6	7	6
	Spatial Resolution (m)	12.69 cm	12.61 cm	12.44 cm	12.50 cm
Quanergy LiDAR	# GCPs used	6	2	-	6
	# Check pints used	4	4	11	4
	Unconstrained RMSEz	0.445 m	0.42 m	0.047 m	1.971 m
	Constrained RMSEz	0.051 m	0.078 m	-	0.049 m
	DEM Point Spacing in m	0.11	0.08	0.07	0.07
	Raster Size in m	0.4	0.3	0.28	0.3
QL2 LiDAR	DEM Point Spacing in m	0.63	2.90	2.16	0.63
	Raster Size in m	2.5	11.6	8.65	2.5
# Of pixels for Training Data	UAS Stack	162	142	138	86
	Airborne Stack	163	157	142	83

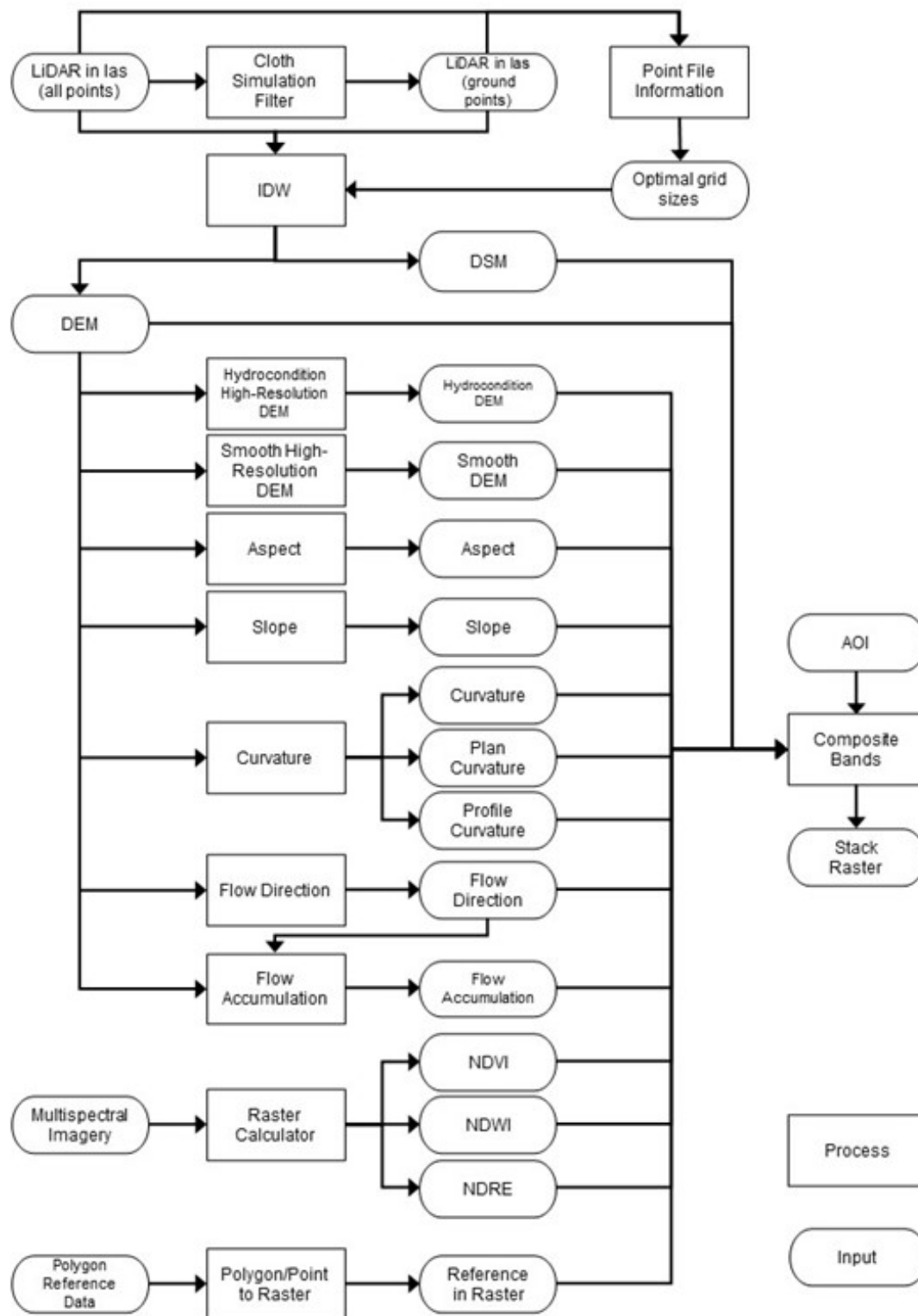


Figure S1. Workflow diagram showing the datasets, pre-processing, and processing steps used to derive random forest model inputs (raster stacks) for each site.

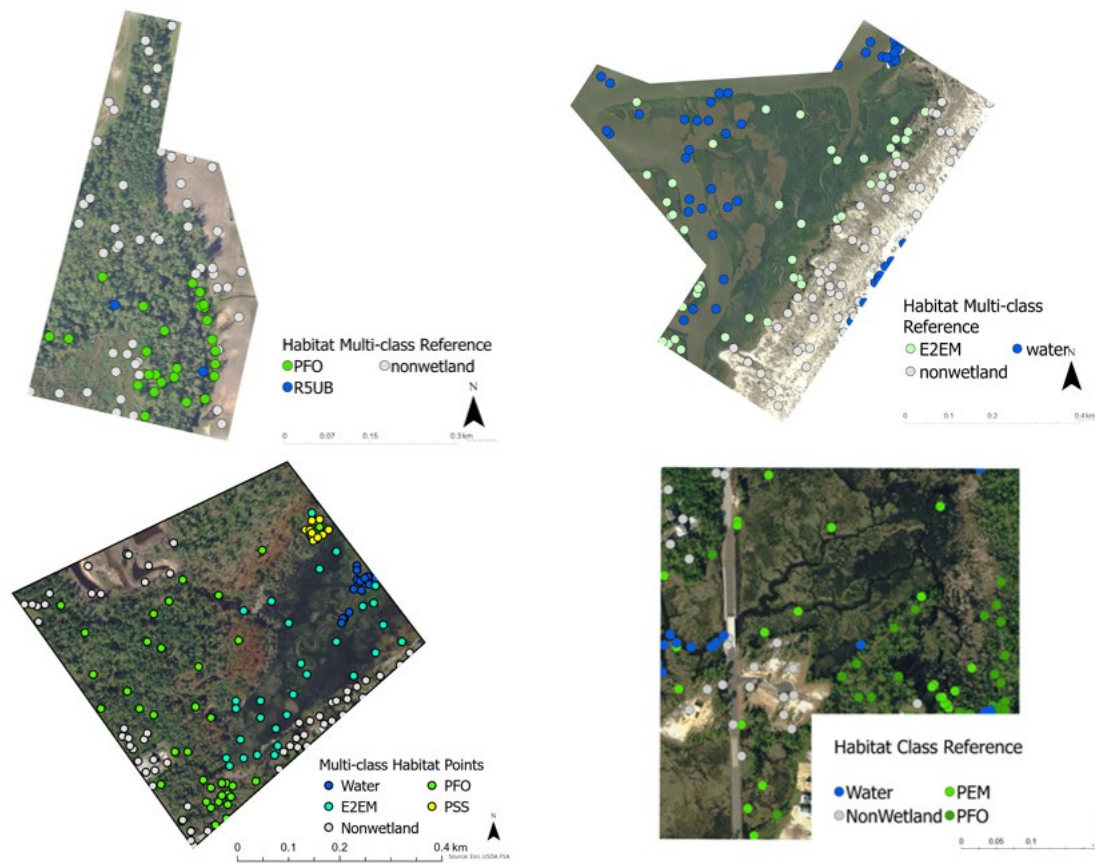


Figure S2. Habitat point distribution for each site overlaid on NAIP 2020 imagery

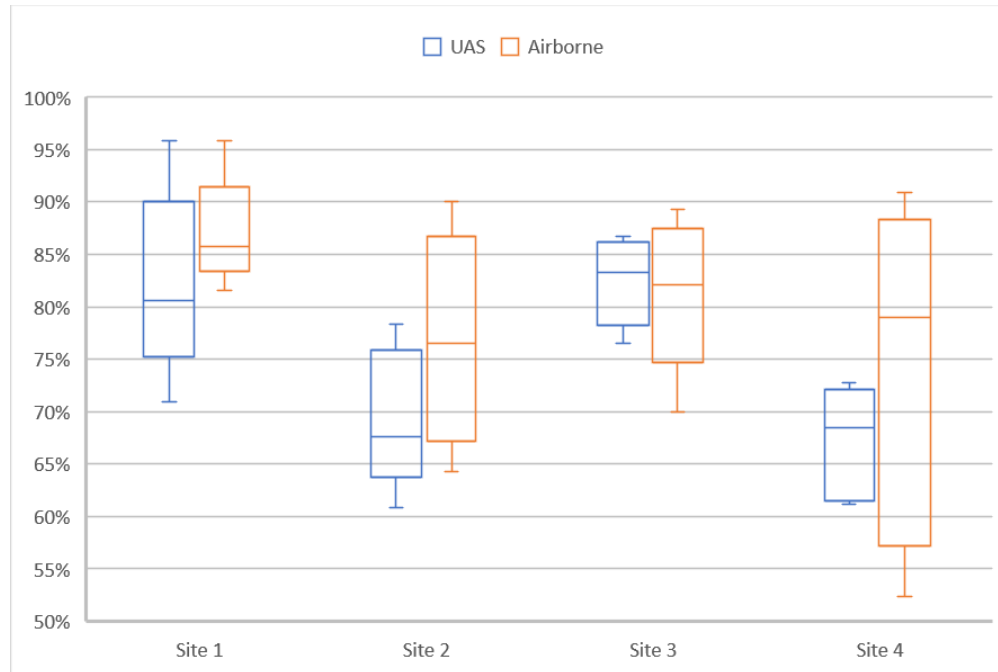


Figure S3. The standard deviation of the overall accuracy for each site (for each of the 5-fold cross validated models).

Table S2. Class sensitivity and specificity metrics for all models for all four study sites (QL2+MS indicates models parameterized with the airborne LiDAR and UAS multispectral data while Quanergy + MS denotes models parameterized with the UAS LiDAR and multispectral).

Site	Predictor	Class	Sensitivity	Specificity
Site 1 Maysville	QL2 + MS	Non-wetland open	91.67%	92.98%
		Non-wetland forest	72.41%	97.74%
		PFO	88.68%	94.50%
		water	96.88%	98.46%
	Quanergy + MS	Non-wetland-open	83.33%	91.30%
		Non-wetland-forest	75.86%	96.27%
		PFO	86.79%	93.64%
		water	93.94%	98.46%
Site 2 Masonboro	QL2 + MS	Non-wetland	84.00%	89.77%
		Water	79.17%	92.22%
		E2EM	85.00%	91.84%
	Quanergy + MS	Non-wetland	90.38%	87.78%
		Water	75.51%	95.70%
		E2EM	87.80%	93.07%
Site 3 Surf City	QL2 + MS	E2EM	87.04%	93.18%
		Non-wetland	75.68%	94.29%
		PFO	91.67%	99.23%
		water	90.00%	95.54%

		PSS	66.67%	96.24%
	Quanergy + MS	E2EM	81.97%	88.54%
		Non-wetland	65.79%	91.60%
		PFO	100.00%	99.30%
		water	93.33%	89.76%
		PSS	15.38%	98.61%
Site 4 River Road	QL2 + MS	Non-wetland	69.23%	88.33%
		PEM	79.17%	80.65%
		PFO	86.96%	96.83%
		water	46.15%	97.26%
	Quanergy + MS	Non-wetland	60.87%	88.33%
		PEM	87.50%	79.66%
		PFO	86.96%	98.33%
		water	53.85%	98.57%

Figure S4. 3-dimensional visualizations of the four sites showing the UAS-collected LiDAR data for sites 1 through 4 as shown in Figure 2 (the elevation scales are the same for all 4 frames, although not included in each).

